# TBD04 – (Part 04) Lipids

Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. B.4.1 **Compare** the composition of the three types of lipids found in the human body. (3) Examples include triglycerides (fats and oils), phospholipid (lecithin) and steroids (cholesterol).
   1. What is a lipid?
   2. Compare the three kinds:

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Similarities** | | **Differences** |
| **Triglycerides** |  |  | |
| **Phospholipid** |  | |
| **Steroid** |  | |

1. B.4.2 **Outline** the difference between HDL and LDL cholesterol and outline its importance. (2)
2. B.4.3 **Describe** the difference in structure between saturated and unsaturated fatty acids. (2) Most naturally occurring fats contain a mixture of saturated, mono-unsaturated and poly-unsaturated fatty acids and are classified according to the predominant type of unsaturation present.
   1. Saturated v unsaturated?
   2. Why can’t a saturated fatty acid react with a halogen?
   3. Sketch (roughly) a saturated and unsaturated fatty acid:

|  |  |
| --- | --- |
| **Saturated** | **Unsaturated** |
|  |  |

* 1. Where do saturated and unsaturated fatty acids originate?

1. B.4.4 **Compare** the structures of the two essential fatty acids linoleic (omega–6 fatty acid) and linolenic (omega–3 fatty acid) and state their importance. (3)

|  |  |  |
| --- | --- | --- |
|  | **Linoleic (Omega-6)** | **Linolenic (Omega-3)** |
| **Structure** |  |  |
| **Facts/Function/etc** |  |  |

* 1. Describe trans-unsaturated and hydrogenated fats, where are they found, what do they behave like?

1. B.4.5 **Define** the term iodine number **and calculate** the number of C=C double bonds in an unsaturated fat/oil using addition reactions. (2) The number of moles of I2 reacting with one mole of fat/oil indicates the number of double bonds present in the fat/oil molecule.
   1. Definition for Iodine number:
   2. Example calculation for Calculating Iodine number (follow slide):
2. B.4.6 **Describe** the condensation of glycerol and three fatty acid molecules to make a triglyceride. (2)
   1. What are the parts that go into making a triglyceride? Draw them:
3. B.4.7 **Describe** the enzyme-catalysed hydrolysis of triglycerides during digestion. (2)
   1. Hydrolysis cannot be achieved directly because……
   2. Hydrolysis is the opposite of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, and is what?
   3. What goes into breaking down triglycerides, explain and describe the process…
4. B.4.8 **Explain** the higher energy value of fats as compared to carbohydrates. (3)
5. B.4.9 **Describe** the important roles of lipids in the body and the negative effects that they can have on health. (2) Important roles include: the risk of heart disease, cholesterol. Negative effects include: fatty acids; fats, in particular lauric (C12), myristic (C14) and palmitic (C16) acids
   1. Major function of Lipids:
   2. Structural function:
   3. Role of individual Lipids
      1. Phospholipids
      2. Lipoproteins
      3. Steroids
      4. Omega-3
      5. Mono-unsaturated fat
      6. Animal fat
      7. Transfats